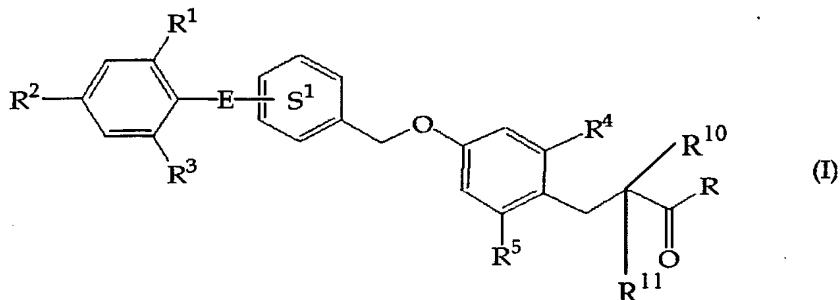


Claims

1. A compound represented by the formula (I):



5 wherein

$R^1$ ,  $R^3$ ,  $R^4$  and  $R^5$

are the same or different and each is a hydrogen atom, a halogen atom, an optionally substituted hydrocarbon group or an optionally substituted hydroxy group;

10  $R^2$  is a halogen atom, a nitro group, an optionally substituted hydrocarbon group, an optionally substituted hydroxy group, an optionally substituted amino group, an optionally substituted mercapto group, an optionally substituted acyl group or an optionally substituted heterocyclic group;

15  $R^{10}$  and  $R^{11}$  are the same or different and each is a hydrogen atom, a halogen atom or a  $C_{1-6}$  alkoxy group;

20  $E$  is a bond, an optionally substituted  $C_{1-4}$  alkylene group,  $-W^1-O-W^2-$ ,  $-W^1-S-W^2-$  or  $-W^1-N(R^6)-W^2-$  (wherein  $W^1$  and  $W^2$  are the same or different and each is a bond or an optionally substituted  $C_{1-3}$  alkylene group, and  $R^6$  is a hydrogen atom, an optionally substituted acyl group or an optionally substituted hydrocarbon group);

25 ring  $S^1$  is a benzene ring optionally further having substituent(s) selected from a halogen atom, an optionally substituted hydrocarbon group, an optionally substituted hydroxy group and an optionally substituted amino group; and

$R$  is an optionally substituted hydroxy group or an optionally substituted amino group;

provided that  $R^1$  and  $R^3$  are not simultaneously a hydrogen atom,

or a salt thereof.

2. The compound of claim 1, wherein R<sup>2</sup> is a halogen atom, an optionally substituted hydrocarbon group, an optionally substituted hydroxy group, an optionally substituted amino group, an optionally substituted mercapto group or an optionally substituted heterocyclic group, and R<sup>10</sup> and R<sup>11</sup> are both hydrogen atoms, or a salt thereof.

<sup>10</sup> 3. A prodrug of a compound of claim 1 or a salt thereof.

4. The compound of claim 1, wherein R<sup>4</sup> and R<sup>5</sup> are the same or different and each is a hydrogen atom or a halogen atom, or a salt thereof.

<sup>15</sup>

5. The compound of claim 1, wherein E is a bond, or a salt thereof.

<sup>20</sup> 6. The compound of claim 1, wherein R is a hydroxy group, or a salt thereof.

7. The compound of claim 1, wherein R<sup>1</sup> and R<sup>3</sup> are the same or different and each is a C<sub>1-6</sub> alkyl group, or a salt thereof.

<sup>25</sup> 8. The compound of claim 1, wherein R<sup>2</sup> is an optionally substituted hydroxy group, or a salt thereof.

9. The compound of claim 1, wherein R<sup>10</sup> and R<sup>11</sup> are both hydrogen atoms, or a salt thereof.

<sup>30</sup>

10. The compound of claim 1, wherein ring S<sup>1</sup> is a benzene ring optionally further having a C<sub>1-6</sub> alkoxy group, or a salt thereof.

11. 3-[4-[[4'-(benzyloxy)-2',6'-dimethylbiphenyl-3-yl]methoxy]phenyl]propanoic acid;  
3-(4-{[4'-(2-ethoxyethoxy)-2',6'-dimethylbiphenyl-3-yl]methoxy}phenyl)-2,2-difluoropropanoic acid;

5 3-[4-((4'-[2-(ethylsulfonyl)ethoxy]-2',6'-dimethylbiphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;  
3-[4-((2',6'-dimethyl-4'-[3-(2-oxopyrrolidin-1-yl)propoxy]biphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;  
3-[4-((2',6'-dimethyl-4'-[(6-methylpyridin-2-  
10 yl)methoxy]biphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;  
3-[2-fluoro-4-((4'-[(4-hydroxy-1,1-dioxidotetrahydro-2H-thiopyran-4-yl)methoxy]-2',6'-dimethylbiphenyl-3-  
yl)methoxy]phenyl]propanoic acid;  
3-[4-((2',6'-dimethyl-4'-[(methylsulfonyl)oxy]biphenyl-3-  
15 yl)methoxy)-2-fluorophenyl]propanoic acid;  
3-[4-((4'-[(1,1-dioxidotetrahydro-2H-thiopyran-4-yl)oxy]-2',6'-  
dimethylbiphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;  
3-[4-((2',6'-dimethyl-4'-[(3-methyloxetan-3-yl)methoxy]biphenyl-  
3-yl)methoxy)-2-fluorophenyl]propanoic acid;

20 3-(4-[[2',6'-dimethyl-4'-(tetrahydro-2H-pyran-4-yloxy)biphenyl-3-yl)methoxy]-2-fluorophenyl)propanoic acid;  
3-[4-((4'-[3-(diethoxyphosphoryl)propoxy]-2',6'-  
dimethylbiphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;  
3-[2-fluoro-4-((6-isopropoxy-2',6'-dimethyl-4'-[(3-methyloxetan-  
25 3-yl)methoxy]biphenyl-3-yl)methoxy]phenyl]propanoic acid;  
or a salt thereof.

12. A GPR40 receptor function modulator comprising a compound of claim 1 or a salt thereof or a prodrug thereof.

30

13. A pharmaceutical agent comprising a compound of claim 1 or a salt thereof or a prodrug thereof.

14. The pharmaceutical agent of claim 13, which is an agent for the prophylaxis or treatment of diabetes.

15. Use of a compound of claim 1 or a salt thereof or a prodrug thereof for the production of a GPR40 receptor function modulator.

16. Use of a compound of claim 1 or a salt thereof or a prodrug thereof for the production of an agent for the prophylaxis or treatment of diabetes.

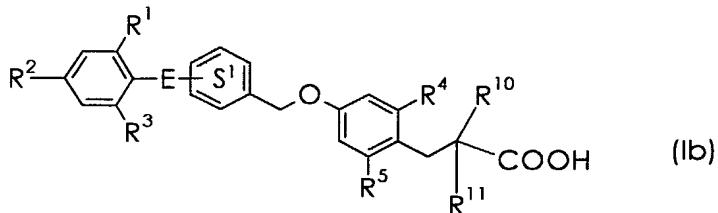
17. A method of modifying a GPR40 receptor function in a mammal, which comprises administering an effective amount of a compound of claim 1 or a salt thereof or a prodrug thereof to the mammal.

15

18. A method for the prophylaxis or treatment of diabetes in a mammal, which comprises administering an effective amount of a compound of claim 1 or a salt thereof or a prodrug thereof to the mammal.

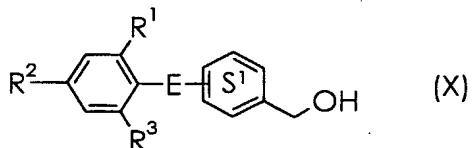
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19. A production method of a compound represented by the formula (Ib) :

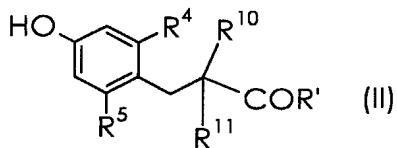


wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>10</sup>, R<sup>11</sup>, E and ring S<sup>1</sup> are as defined in claim 1,

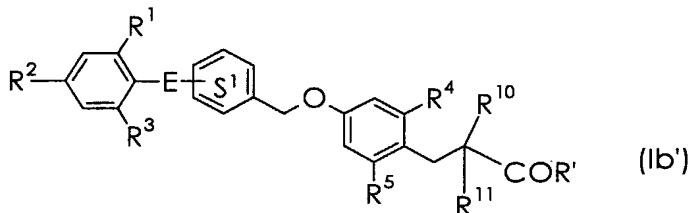
or a salt thereof, which comprises reacting a compound represented by the formula (X) :



wherein each symbol is as defined above,  
or a salt thereof, and a compound represented by the formula  
(II) :

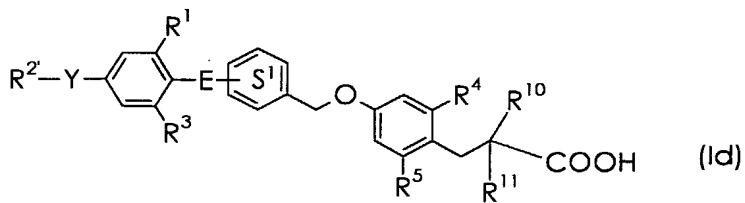


5 wherein R<sup>4</sup>, R<sup>5</sup>, R<sup>10</sup> and R<sup>11</sup> are as defined above, and R' is an  
optionally substituted C<sub>1-6</sub> alkoxy group,  
or a salt thereof, to give a compound represented by the formula  
(Ib') :

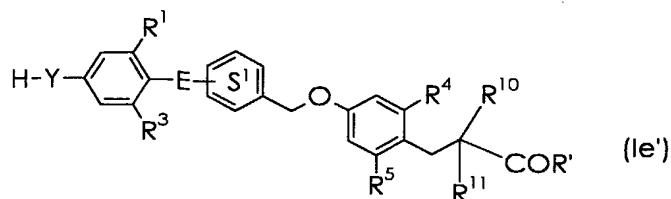


10 wherein each symbol is as defined above,  
or a salt thereof, and subjecting the compound or a salt thereof  
to a hydrolysis reaction.

20. A production method of a compound represented by the formula  
15 (Id) :



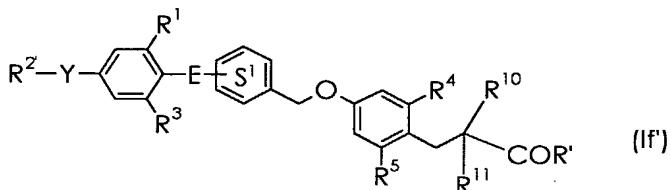
wherein R<sup>1</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>10</sup>, R<sup>11</sup>, E and ring S<sup>1</sup> are as defined in  
claim 1, Y is -O- or -S-, and R<sup>2</sup> is a substituent,  
or a salt thereof, which comprises reacting a compound  
20 represented by the formula (Ie') :



wherein  $R^1$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^{10}$ ,  $R^{11}$ ,  $E$  and ring  $S^1$  are as defined above,  $R'$  is as defined in claim 19, or a salt thereof, and a compound represented by the formula:

5  $R^{2'}-OH$

wherein  $R^{2'}$  is as defined above, or a salt thereof, to give a compound represented by the formula (If'):



10 wherein each symbol is as defined above, or a salt thereof, and subjecting the compound or a salt thereof to a hydrolysis reaction.